

REMARKS

Claims 1-24 have previously been canceled. In this response, Applicant has amended claim 46 to correct a typographical error. Following entry of the amendments, claims 25-49 are currently pending in the application.

Applicant has also amended the specification to correct an error. However, this amendment does not introduce new matter as the specific amendment is supported by the description as originally-filed, on page 6, lines 2-4 and in FIG. 5.

Rejection Under Section 112

The Office Action maintains the rejection of claims 25-49 under 35 U.S.C. § 112, ¶ 1, as allegedly failing to comply with the enablement requirement. The Office Action alleges that one skilled in the art cannot implement the invention with the information presented in Figs. 6 and 7, if he does not know how to determine the water vapor pressure PWS_n , which is necessary for calculating the hydrogen partial pressure, PH_{2n} .

Applicant respectfully traverses this rejection of the claims as discussed in greater detail below.

First, the amendment to the specification may help to clarify the situation. Providing that PWS_n denotes a water vapor partial pressure of the anode gas as amended in the specification, the water vapor partial pressure PWS_n of the anode gas calculated on the basis of the temperature of the fuel cell stack means that PWS_n is determined from a saturated water vapor pressure which is dependent on a temperature of the fuel cell. Applicant submits that it is known by one skilled in the art at the time of the invention that the saturated vapor pressure is dependent on the gas temperature of the temperature of the fuel cell.

Second, in the fuel cell art at the time of the invention, it was known that, when a fuel cell is operative, there is an inverted water diffusion from the cathode side to the anode side. The moisture resulting from this inverted water diffusion saturates the anode gas passage with water vapor, except in the vicinity of the inlet of the anode gas passage. As a result, downstream in the anode gas passage, condensed water is apt to be generated.

Accordingly, it is practical to handle the water vapor partial pressure in the anode gas to be substantially equal to a saturated water vapor pressure, which can be estimated from the temperature of the fuel cell. Applicant submits that the teaching of processing condensed

water generated in the anode gas passage is shown in other references, such as Japanese Published Patent Applications JP2008-134620A and JP2007-214062, for example.

Third, where the electrolyte membrane creates a relatively small inverted water diffusion and where an anode effluent discharged from the anode gas passage outlet of a fuel cell stack is recirculated into the anode gas passage inlet as shown in FIGS. 1 and 8, gas components other than water vapor in the anode gas effluent take a minimum value at the anode gas passage outlet. In a stable state operation, the anode gas is saturated with water vapor. As a result, the water vapor partial pressure is substantially equal to the saturated water vapor pressure, which can be estimated from the temperature of the fuel cell.

To summarize these points set forth above, the information presented in FIG. 5 sets forth that the water vapor partial pressure PWS_n in the anode gas is substantially equivalent to the saturated water vapor pressure, which is known to be determined dependent solely on the temperature. Further, the saturated water vapor pressure is not affected by the conditions of the fuel cell stack other than the temperature.

Applicant also wishes to maintain the arguments provided in the prior response. Applicant respectfully submits that the prior arguments are perhaps better understood after consideration of the additional remarks above.

CONCLUSION

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith,

Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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